NEW DISTRIBUTION RECORDS AND NOTES ON THE LARVA OF *UROTHEMIS ALIENA* SELYS (ODONATA: UROTHEMISTIDAE)

CHRIS J. BURWELL[1] and GUNTHER THEISCHINGER[2]

[1]*Higher Entomology Section, Queensland Museum, PO Box 3300, South Brisbane, Qld 4101*

[2]*2A Hammersly Road, Grays Point, NSW 2232*

Abstract

The distribution of *Urothemis aliena* Selys in Australia is presented, based primarily on specimens in Australian insect collections. Specimens collected at two south-eastern Queensland localities, Enoggera Reservoir and Birkdale, extend its known range by almost 1000 km to the south-east. *U. aliena* is also recorded for the first time from Cape York Peninsula in northern Queensland. The final instar larval exuviae of *U. aliena* is illustrated and diagnostic features are provided.

Introduction

Urothemis aliena Selys is the only Australian representative of the genus and also occurs in New Guinea (Lieftinck 1942, Houston and Watson 1988, Watson *et al.* 1991). Fraser (1960) and Watson *et al.* (1991) provided keys enabling the identification of adults of *U. aliena*. It is a medium-sized dragonfly with the abdomen of males broad, unconstricted and bright red, while that of females is narrower and tan-coloured. Both sexes have small, mid-dorsal, dark markings on abdominal segments 8 and 9 and have the bases of the hindwings darkly infuscated, the dark areas not extending to the bases of the hindwing triangles (Fig. 1).

Fig. 1. Male *Urothemis aliena* from Birkdale, SE Qld, collected in December 1990.

Urothemis aliena inhabits riverine lagoons, ponds and pools (Watson 1973, Watson and Abbey 1980, Thompson 1991, Watson *et al.* 1991) or slow-flowing rivers (Fraser 1960). Watson (1973) also found adults in forest well away from water. In Australia, Lieftinck (1949) and Fraser (1960) recorded *U. aliena* from northern Queensland and Watson (1974) and Watson *et al.* (1991) recorded it from three regions in northern Australia; the Kimberley region of Western Australia, the 'Top End' of the Northern Territory and north-eastern Queensland. Thompson (1991) confirmed its presence in the Kimberley, recording the species from the west of the region.

While undertaking an insect survey of Enoggera Reservoir in Brisbane's north-western suburbs, three specimens of *Urothemis aliena*, two males and one female, were collected. Subsequently a single male collected at Birkdale in Redland Shire was brought to the attention of CJB. These records from south-eastern Queensland represent a significant extension to the known range of *U. aliena*.

Distribution of *U. aliena* in Australia

Precise information on the distribution of *U. aliena* is limited. The only published locality for the species in Queensland is Innisfail (Fraser 1960). In addition, a single male from Bowen identified as *Urothemis signata bisignata* Brauer by Ris (1913) probably refers to *U. aliena* (see Lieftinck 1942). In the Northern Territory, *U. aliena* is known from the Alligator Rivers region (Watson 1973) where Watson and Abbey (1980) specifically noted it from main channel and flood plain lagoons of Magela Creek.

Due to the lack of detailed information on its distribution we compiled Australian records of *U. aliena*. The data are primarily based on specimens in Australian insect collections, supplemented by additional records from a limited number of overseas institutions. The dragonflies in the Queensland Museum, Queensland Department of Primary Industries Collection and the University of Queensland Insect Collection were examined by CJB and those in the Australian Museum and Australian National Insect Collection by GT. Details of specimens in other collections were supplied by their respective curators and collection managers, *i.e.* specimens were not examined by the authors.

Abbreviations for specimen depositories are as follows: AM - Australian Museum, Sydney; ANIC - Australian National Insect Collection, Canberra; BMNH - The Natural History Museum, London; GTC - Gunther Theischinger Collection, Sydney; NTM - Museum and Art Gallery of the Northern Territory, Darwin; QM - Queensland Museum, Brisbane; DPC - Dennis Paulson Collection, Tacoma, Washington.

Material. WESTERN AUSTRALIA: 1 ♂, Beverley Springs Station, 2.v.1988, D.J. Thompson (?ANIC). NORTHERN TERRITORY: 1 ♂, 11°45'S, 130°55'E, creek 3 km NE of Pickertaramoor, Melville Island, 12.x.1996, G.R. Brown and G. Daly

(NTM); 5 ♂♂, 5 ♀♀, Yirrkala Mission, Arnhem Land, 31.i.-3.ii.1968, J.A.L. Watson (ANIC); 1 ♀, 12°25'S 132°58'E, 1 km N of Cahills Crossing, East Alligator River, 8-9.xi.1972, J.A.L. Watson (ANIC); 1 ♂, same data except 11-12.xi.1972 (ANIC); 1 ♀, same data except 31.x.1972, M.S. Upton (ANIC); 2 ♂♂, 12°25'S 132°59'E, Lagoon 12 km SW by S of Oenpelli, 31.v.1973, J.A.L. Watson (ANIC); 1 ♂, same data except 12.xi.1972 (ANIC); 1 ♂, Jabiluka Lagoon, Magela Creek, 5.xii.1979, J.A.L. Watson (ANIC); 1 ♂, Island Lagoon, Magela Creek, 3.xii.1979, J.A.L. Watson (ANIC); 1 ♂, 12°35'S 132°52'E, Magela Creek, 2 km N of Mudginbarry H/S, 14-15.xi.1972, J.A.L. Watson (ANIC); 1 ♂, Corndorl Billabong, Jabiru East, 12.xi.1990, emerged 4.xii.1990, P.L. Dostine (ANIC, adult and associated exuvium in spirit); 1 ♂, 1 ♀, 12°46'S 132°39'E, Nourlangie Creek, 12 km NNW of Mt Cahill, 20-21.v.1973, J.A.L. Watson (ANIC); 1 ♂, 1 ♀, 12°48'S 132°39'E, Nourlangie Creek, Woolowonga, 8 km N of Mt Cahill, 21-22.v.1973, J.A.L. Watson (ANIC); 1 ♂, Buffalo Lagoon, Mudginberri, 1.xii.1979, J.A.L. Watson (ANIC); 1 ♂, 14°09'S 130°04'E, near Tom Turners Crossing, Peppimenarti, 27.viii.1974, J. Hutchinson (ANIC). QUEENSLAND: 3 ♂♂, Swamp near Wenlock R. crossing, Coen - Iron Range Rd, 29.x.1974, M.S. Moulds (AM); 1 ♂, pond at hwy 81 just N Rifle Creek, 1 km N Mount Molloy, 23.xii.1998, D.R. Paulson, N. Smith (DPC); 1 ♂, Mena Creek, Paronella Park, Innisfail, 26.xi.1951, R. Dobson (ANIC); 1 ♂, Reid River, between Townsville and Charters Towers, 29.xi.1976, G. Theischinger (GT); 2 ♂♂, 1 ♀, N[orth] Queensland, 5.vi.50, Wall. (BMNH); 1 ♀, 27°27'S 152°55'E, Enoggera Reservoir, site 3, 100 m, 16.xi.1999, C.J. Burwell, S.G. Evans, R. Lewry (QM); 1 ♂, 1 ♀, 27°27'S 152°55'E, Enoggera Reservoir, site 3, 100 m, 20.xi.1999, C.J. Burwell, (QM); 1 ♂, Collingwood Road, Birkdale, 16.xii.1990, R. Nattrass (QM).

The distribution of *U. aliena* in Australia is presented in Fig. 2 and is overlain by the regions used by Watson (1974, 1977) and Watson *et al.* (1991) to summarise dragonfly distributions. *Urothemis aliena* is now known from two regions in addition to those listed by Watson *et al.* (1991), Cape York Peninsula (Wenlock River crossing) and south-eastern Queensland (Enoggera Reservoir and Birkdale). The two south-eastern Queensland localities represent an extension to the known range of *U. aliena* of almost 1000 km.

Although Watson (1974) recorded *U. aliena* from the Kimberley, we were unable to locate specimens collected from this region prior to 1974. In fact, we discovered only one record of the species from the Kimberley, a single male collected from Beverley Springs Station (D.J. Thompson pers. comm.). This specimen was thought to be deposited in ANIC but was not located by GT when he examined the collection.

Urothemis aliena at Enoggera Reservoir

Enoggera Reservoir is located in Brisbane's north-western suburbs and is the smallest of Brisbane's four water sources. It is fed by Enoggera Creek with a catchment of 33 km^2, virtually all of which is forested and lies within Brisbane Forest Park. The reservoir supports a relatively rich odonate fauna of seven species of damselflies and 19 other species of dragonflies (Reeves 2002).

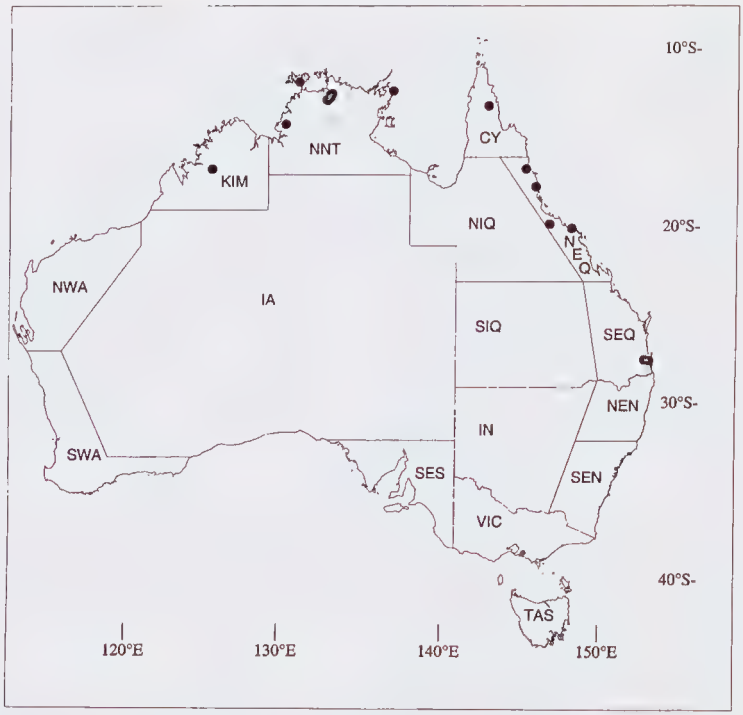

Fig. 2. Distribution of *Urothemis aliena* in Australia. For a full explanation of the regions see Watson *et al.* 1991. CY, Cape York Peninsula; IA, inland Australia; IN, inland New South Wales; KIM, Kimberley Region; NEN, north-eastern New South Wales; NEQ, north-eastern Queensland; NIQ, northern inland Queensland; NNT, northern Northern Territory; NWA, north-western Western Australia; SEN, south-eastern New South Wales; SES, south-eastern South Australia; SEQ, south-eastern Queensland; SIQ, southern inland Queensland; SWA, south-western Western Australia; TAS, Tasmania; VIC, Victoria.

Specimens of *U. aliena* were collected at the apex of a peninsula on the north-eastern side of the reservoir (27°26'44"S 152°55'19"E). One male and two females were collected on two days in mid-November 1999. One female was collected at the water's edge. A male and female and several other individuals that could not be captured, were perched on prominent twigs of a tree in a cleared area that was largely surrounded by vegetation but was open to the reservoir on its eastern aspect. The tree was situated about 100 m from the water's edge on a hillside at an elevation of about 20 m above the water surface. Individuals perched at heights between approximately 3.5 and 7 m above the ground. They were difficult to capture, quickly taking flight when approached. Although they sometimes returned to the same tree, they usually alighted on higher perches.

Fraser (1960) also noted that *U. aliena* perched on prominent stems or twigs and that the species was 'extremely shy and very quick in the off-take and difficult to capture'. Given that both sexes of *U. aliena* were observed, it is very probable that a resident breeding population is present at Enoggera Reservoir. We consider it highly unlikely that the observed specimens were vagrants.

Larva of *U. aliena*

The larva of *U. aliena* was first identified by Hawking (1993) on the basis of a single reared specimen from Corndorl Billabong, East Jabiru, in the Alligator Rivers Region of the Northern Territory. Hawking (1993) included the species is his key to known libellulid larvae of the region and provided notes enabling its identification. However, he did not illustrate the larva and there are some discrepancies between his descriptive notes and the actual larval exuviae. The final instar larval exuviae of the specimen from Corndorl Billabong is illustrated below (Fig. 3).

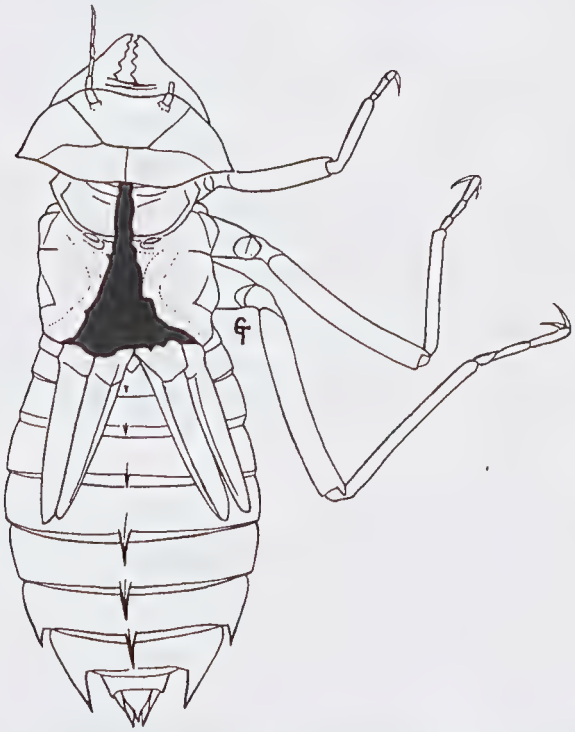

Fig. 3. Final instar exuviae of a reared specimen of *Urothemis aliena* from Corndorl Billabong, East Jabiru, Northern Territory (only right legs illustrated).

The following revised diagnosis enables the identification of mature *U. aliena* larvae: eyes extended to posterior corners of head and pointed; mid-dorsal spines on abdominal segments 3-8, those on 6-8 quite large; lateral spines on abdominal segments 8 and 9, those on 8 shorter, those on 9 at least as long as mid-dorsal length of respective segment.

Discussion

Based on the paucity of specimens of *U. aliena* in collections, it would appear that it is an uncommon dragonfly across much of its range. Certainly Thompson (1991) noted that it was uncommon, even in suitable habitat, in the western Kimberley region. The species appears more common in northern NT where more than two thirds of the specimens listed here were collected. However, intensive sampling of dragonflies from the Alligator Rivers region (Watson 1973, Watson and Abbey 1980) and the large number of specimens collected from Yirrkala, Arnhem Land, possibly result in an overestimate of its relative abundance in the 'Top End'. Clearly *U. aliena* is uncommon in Queensland where it is known from only a handful of specimens and localities. In addition, numerous papers listing dragonflies from areas in Queensland where *U. aliena* might conceivably occur do not record the species (Lieftinck 1951, Reeves 1978, 1987, 1988, 1990, 1993, Arthington and Watson 1982, Reeves and Woodall 1991, Woodall 1993).

In the northern hemisphere, several species of dragonflies and damselflies are apparently expanding their ranges northwards in Europe and North America, which some authors have suggested might be related to global warming (Ott 2000, Paulson 2001). The new records of *U. aliena* from south-eastern Queensland may represent a similar southwards range expansion in the southern hemisphere. However, the extreme paucity of collection records of *U. aliena* in Queensland make it difficult to place much strength in this hypothesis. Alternatively, it is quite possible that south-eastern Queensland is part of the normal range of *U. aliena* and it has merely been overlooked until now.

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